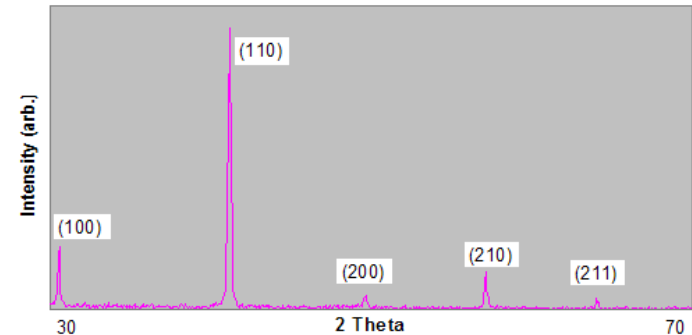


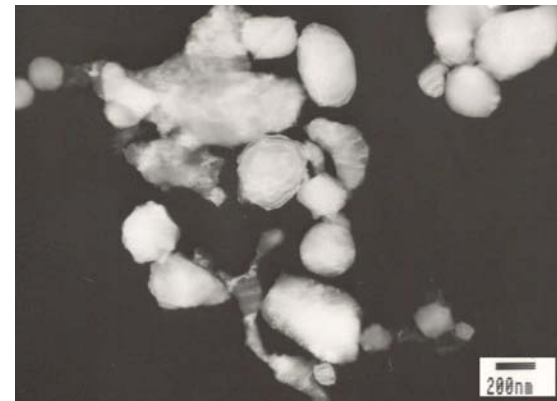
# Synthesis and consolidation of nickel aluminide powder

Baburaj Eranezhuth, University of Houston, DMR 0210970

Aluminides are unique light weight high temperature materials, consisting of ordered alloy phases formed between aluminum and other metals. The process of simultaneous reduction and alloying demonstrated in this SGER program proves the feasibility of producing microcrystalline aluminide powders with out the conventional concerns about oxidation. Single phase NiAl intermetallic formed by the reaction between nickel chloride and aluminum, induced by ball milling of the reactants, followed by sublimation of byproduct,  $\text{AlCl}_3$ , is shown the figures.



XRD pattern from NiAl single phase



TEM micrograph of as synthesized NiAl powder

# **Synthesis and consolidation of nickel aluminide powder**

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- Within the limitations of funding (\$49,500) an undergraduate student, Mr. Kin Tse has been trained to work in the interdisciplinary research area involving chemical synthesis, powder metallurgy, and characterization of nanomaterials. The exposure that Mr. Tse received in the synthesis of advanced materials by a simple chemical process, has helped him to visualize several possible opportunities for the production of nanomaterials. He now plans for a change over from Mechanical engineering to Materials science.
- Because of the economic advantages envisioned in the present process, the University of Houston is currently preparing a patent application. Two papers, one each on synthesis and consolidation of NiAl, and FeAl, are under preparation and will be communicated at a time when the patent application from the university is ready for filing.